

EXECUTIVE SUMMARY

Introduction

The Metropolitan Sewer District of Greater Cincinnati has been actively involved in implementing Sanitary Sewer Overflow (SSO) and Combined Sewer Overflow (CSO) Programs over the past several years. The ultimate cost of compliance with regulatory standards, protection of private property and achievement of Water Quality Standards has been difficult to assess in consideration of changing standards and a more comprehensive understanding of the collection system. This project is intended to provide defensible data to document the long term costs of these programs. The study addresses all currently known SSOs and CSOs in the MSD jurisdictional area.

Costs for these programs are assumed to begin funding in 2001. Construction projects currently underway are assumed to be complete and their costs are not included in these estimates. Summaries of project costs for each program are provided at the beginning of each section.

The report is separated into five sections as follows:

- Combined Sewer Overflow Projects which are presumed to be required to meet Water Quality Standards.
- Combined Sewer Overflow Projects which will assure compliance with Water Quality Standards.
- Sanitary Sewer Overflow Projects necessary to eliminate SSOs to the 10 year storm level.
- Sanitary Sewer Overflow Projects necessary to eliminate SSOs to the 100 year storm level.
- Water-In-Basement (WIB) Projects necessary to eliminate WIB complains associated with insufficient sewer capacity (10 and 100 year).

Combined Sewer Overflow Plans

Two independent CSO remediation plans were considered in an effort to establish the range of effort that may be required in the long term. The first plan, the Water Quality Presumption Plan, represents the proposed level of remediation identified in the 1996 CSO Facilities Plan. The Long Term Control Plan was completed in accordance with Federal and State CSO policies and included the Presumptive Approach in some CSO areas. This represents the minimum effort that the District would consider acceptable as a part of their long term CSO control strategy.

The second remediation plan, the Water Quality Assurance Plan, represents a more comprehensive approach which would assure water quality compliance through CSO capture or elimination. This plan would either eliminate the combined sewer overflows or reduce them to not more than one overflow event per year. The plan accomplishes this by

separation, regional storage, near surface tunnels, or deep tunnels, based on cost effectiveness. Recommendations for this plan are from several sources including the 1991 SWIM Report. Costs have been updated as a result of construction cost escalation since 1991. The tunnel alignment and cost for the Mill Creek Tunnel were taken from the more recent reports by Parsons Brinckerhoff Quade & Douglas, Inc. and BBS Corporation. Assumptions made in developing a method and cost to create the Water Quality Assurance Plan are as follows:

- Separation was chosen for small systems of not more than 20 acres.
- Regional Storage was a choice for combined sewer areas too large to separate and too distant from a wastewater treatment facility.
- Near Surface Tunnels were proposed in areas where there is sufficient open space to allow for open cut construction.
- Deep Tunnels were recommended in highly developed areas so as to reduce disruption to the existing infrastructure.
- In all cases where the CSO discharges to a tunnel or consolidation line, a control structure was proposed.
- In all cases except separation, the receiving wastewater treatment facility was proposed for upgrading to handle the additional flow or to accommodate stored wet weather flow.

Sanitary Sewer Overflow Elimination Projects

The SSO Elimination Program costs were completed for both the 10 year storm and the 100 year storm. All significant SSOs are currently being addressed through either studies or construction projects. These projects were reviewed as a part of this evaluation and costs coordinated between the CSO and SSO Programs.

Assumptions made as a part of the SSO Program Elimination costs include:

- All currently proposed SSO Elimination Projects will eliminate SSO to the 10 year storm frequency.
- Additional protection to the 100 year level will require detention facilities.
- Detention costs will include right-of-way, home demolition, site development, odor control, flushing and pump-back capability.
- Currently proposed projects at Polk Run, Sycamore and Muddy Creek (Secondary Flow Enhancement) are required to provide treatment of SSO.
- Mill Creek WWTP upgrades as described in the Liquid Treatment Process Study (CIP 98-47) will be required to provide treatment of both SSO and CSO.

Water-In-Baseament Elimination Projects

WIB projects were identified using the complaint database in conjunction with CAGIS. Ten years of complaint files were evaluated to identify potentially chronic WIBs that are associated with main line capacity problems. The criteria used for isolating these projects were as follows:

- WIB complaints within 500 feet of a known SSO are assumed to be eliminated as a part of the SSO elimination project.
- Chronic WIBs are defined as main line overload complaints which have been filed at least once within the last two years or at least twice over the past 10 years.

Using these criteria, the 10 year database of over 30,000 complaints was reduced to 264 chronic WIBs which are caused by capacity related problems. Maps of these WIB locations were then reviewed to identify clustered problems which were assumed to be addressed by regional detention basins. Discrete, more remote locations were assumed to be addressed by purchasing and demolishing the homes. This approach was taken for purposes of estimating program costs. Rehabilitation of the system or retention should be considered in the design phase.

In addition, the District is aware from past experience that only a fraction of known WIBs are actually reported. It is estimated that there are likely to be three not reported for every one that is. Therefore, the total cost for WIB elimination has included three additional locations to account for these non-reported WIBs.

Summary of Program Costs

The following is a summary of all program costs. These costs include construction and non-construction related costs, and an additional 10% contingency for planning level estimating purposes.

WET WEATHER PROGRAM COSTS		
	Minimum Effort	Maximum Effort
CSO Program Water Quality Presumption Water Quality Assurance	\$555,401,000 ✓	\$2,250,355,000 ✓
SSO Program 10 Year Storm 100 Year Storm	\$445,323,000 ✓	\$1,080,745,000 ✓
WIB Program 10 Year Storm 100 Year Storm	\$251,097,000 ✓	\$307,692,000 ✓
Total	\$1,251,821,000	\$3,638,792,000